IBD – Ghana

Packaging line of the future

March 2013

“The future depends on what you do today.”
— Mohandas Karamchand Gandhi

Today's presentation

Topics to be covered:

- Objectives of the program
- The Market
- Alternative futures
- Hall and lines of the future
- Archetype details
- Conclusion

Introduction

The objectives of this program

- To develop a set of alternative visions for the future of the Beer business and what requirements these will place on pack lines
- To conceptualise technical options that have the potential to meet the requirements as described on the next page

Overall output – vision 2030

Pack hall / line key indicators

- *Water – <0.15hl/hl*
- *Energy – <10MJ/hl*
- *Renewable energy used % >50%*
- *TPO's <20ppb over 12 months*
- *Productivity >35 000hl/person*
- *Capin / Hl – 50% Vs. 2010*
- *Material usage Yield – <0.005%*
- *Packaged quality > 5.5 Sigma*
- *Changeover time < 5 minutes*
- *ME > 95% (for simple lines)*
- *Waste - 100% recovered and reused*

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The world close to 2030 – A snapshot

Population shift	•61 % of the world population will be in Asia. The population of India will approach the population of China •The emerging and developing countries which accounted for 20 % of the world's wealth in the future it will account for >34%.
Socio-political	•By 2030 China could become the second world economic power and India the sixth economic power of the world •A third of the world population is undernourished; on the other hand obesity increases in developed Countries
Health and climate	•People are on the whole in better health, more prosperous and live longer, inequalities exist between countries and within countries as regards access to health care •Global warming up 2ºC Three billion people will be missing water

Technology in 2030 – A snapshot

Telecommunications	•There will be a worldwide, broadband network of networks based on fibre optics; communications satellites, cellular, and microwave will be ancillary. •The fusion of telecommunications and computation will be complete
Industry	•Totally automated factories will be common but not universal, due to the cost and availability of technology and labour conflicts. •Robots and other automated machinery will be commonplace inside and outside the factory, •The ability to manipulate materials at the molecular or atomic level will a allow manufacturers to customize materials for highly specific functions
Consumer	•In the design of many commercial products such as homes, furnishings, vehicles, and other articles of commerce, the customer will participate directly with the specialist in that product's design.

Various sources

Packs and geographies in 2030

pack prevalence in 2030

Glass	slower growth
Cans	slower growth
Draught	some decline
PET (Polymer)	major growth (off a low base)

Geographic views in 2030

North America, Western Europe	The alcoholic drinks markets of Western Europe and North America are expected to see largely uninspiring volume growth
South America, Africa, Asia	The alcoholic drinks markets in these areas reaffirm, solidify and further expand their key role as global drivers for the alcoholic drinks industry.

Global forecast for beer growth - 2009- 190 million litres – 2030 predicted – 250 m l

Various sources

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Scenario Planning – setting the scene

Scenario planning is a way of preparing for the future

- scenarios are designed to span the space of what MIGHT happen

Scenarios are useful for:

- identifying uncertainties – things which might change
- opening up new possibilities perhaps not thought of before
- exploring the consequences of particular changes in society
- creating and choosing ideas for new product platforms

Each scenario is a believable alternative view of a possible future world

- significant events, people, drivers
- storyline: how it might come about
- early warning indicators

These scenarios are not forecasts, they do not predict the future

- developing scenarios and responses throws up new questions, uncertainties and conflicts: valuable even if the exact scenario never comes to pass

Scenarios help us understand the future – packaging operations perspective

Volume and Variety stand-out in a selection of key drivers of packaging line characteristics

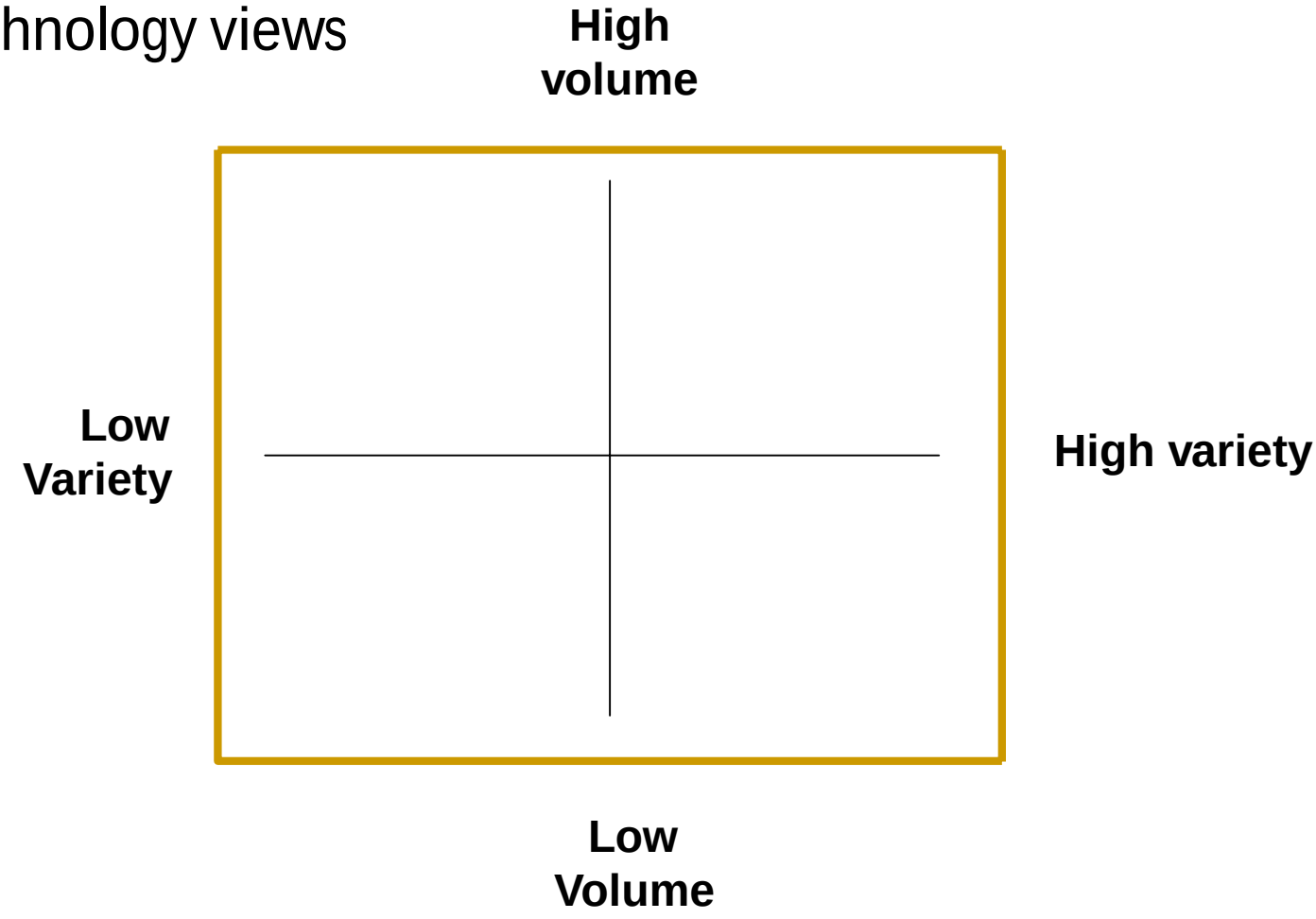
#	Aspects	Typical Characteristics of Systems Choice			
		Non-Repeat	Low Volume Repeat	High Volume Repeat	
1	Products Sold	Skill	⟷	Commodities	
2	Order-Winning Criteria	Unique	⟷	Price, Availability (Quality, Delivery)	
3	Order Qualifyer	Design, Sustaining Skills	⟷	Cost Reduction, Optimisation	
4	Operations key strategic tasks	Low	⟷	High	
5	Ability of the process to cope with product change	High	Medium-Low	Low	
6	Ability of the process to cope with new developments	High	Medium-Low	Low	
7	Process Times	High	Medium-Low	Low	
8	Work environment (inherent motivation)	High	Medium-Low	Low	
9	Staff skill levels	High	Medium-Low	Low	
10	Level of staff technical know	High	⟷	Medium-Low	Low
11	Product Range	High	⟷	Medium-Low	Low
12	Level of product change required	High	⟷	Medium-Low	Low
13	Rate of new product introductions	High	⟷	Medium-Low	Low
14	Operations Volumes	Low	⟷	Medium-High	High
15	Level of specialist support to operations	Low	⟷	Medium-High	High
16	Customer Order Size	Low	⟷	Medium-High	High
17	Number of Customer Orders	Low	⟷	Medium-High	High
18	Nature of the delivery system	General purpose	⟷	Multi-purpose	Dedicated
19	Type of delivery system	Jobbing	⟷	Batching	Line
20	System Flexibility	High	⟷	Medium-Low	Low
21	Dominant Utilisation	Staff	⟷	Equipment	Equipment
22	Level of difficulty of the day-to-day scheduling task	Difficult	⟷	Most difficult	Easy
23	Frequency of Bottlenecks	Predictable	⟷	Highest	Low
24	Most important Operations Mgt perspective	Technology	⟷	Business	

Packaging lines reside here

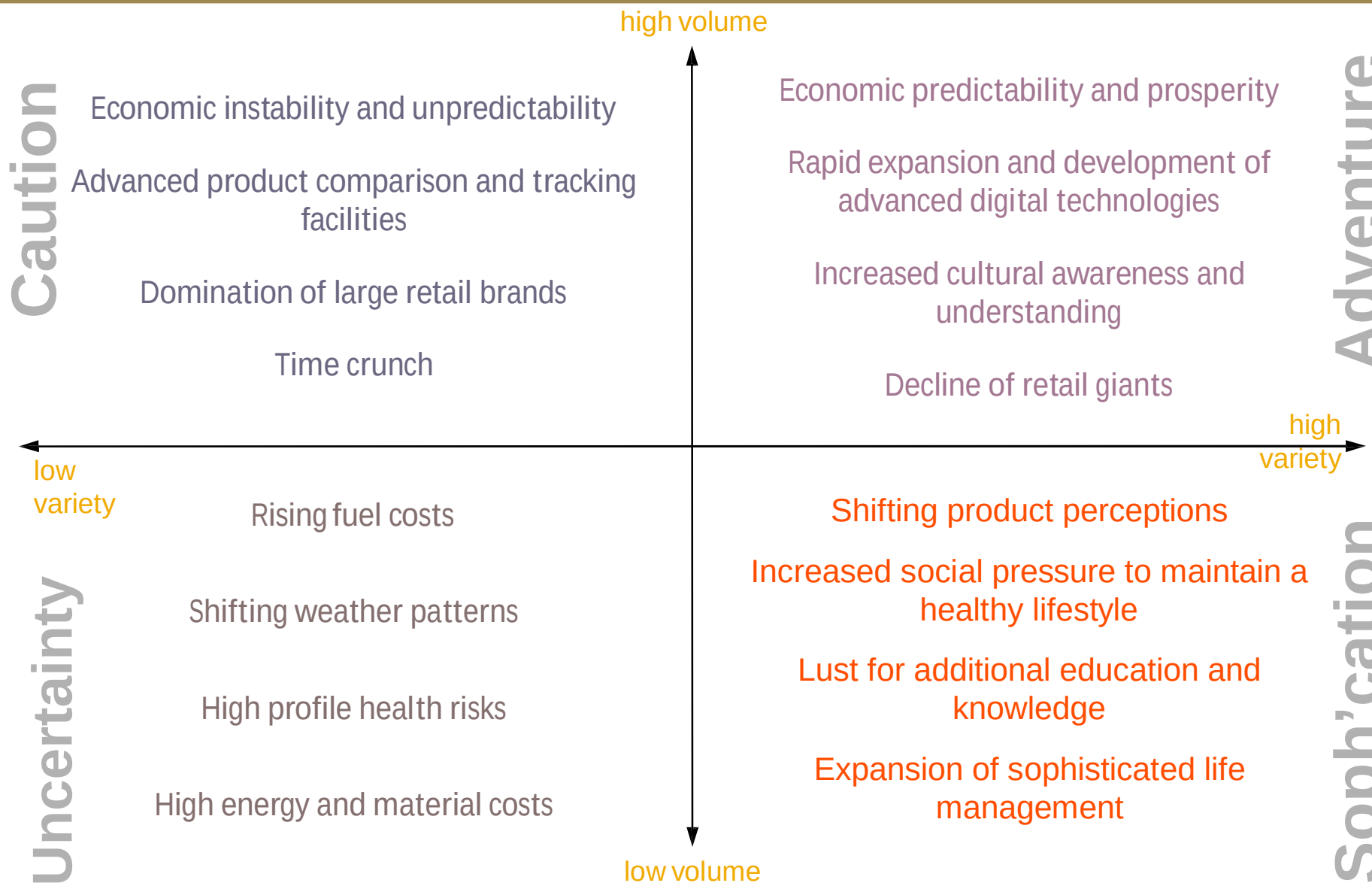
Adapted from Terry Hill

Scenarios help us understand the future

- Volume and Variety stand-out in a selection of key drivers of packaging line choice – when integrating consumer and technology views



Scenarios: Macro Drivers

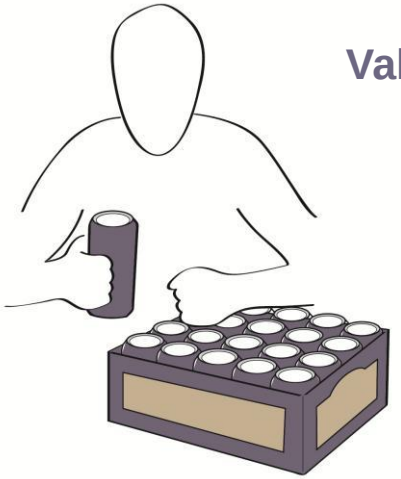


Scenarios: Attitudes to Beer

high volume

Caution

Value Seeker



Explorer

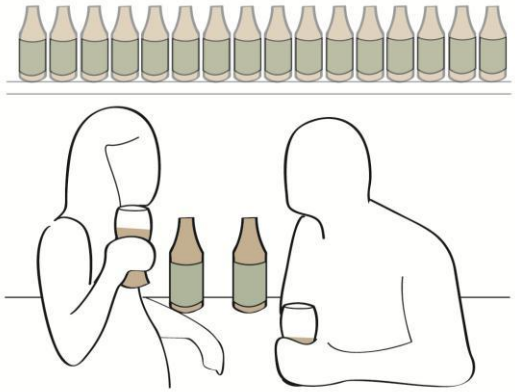
Adventure

low variety

high variety

Uncertainty

Functionalist

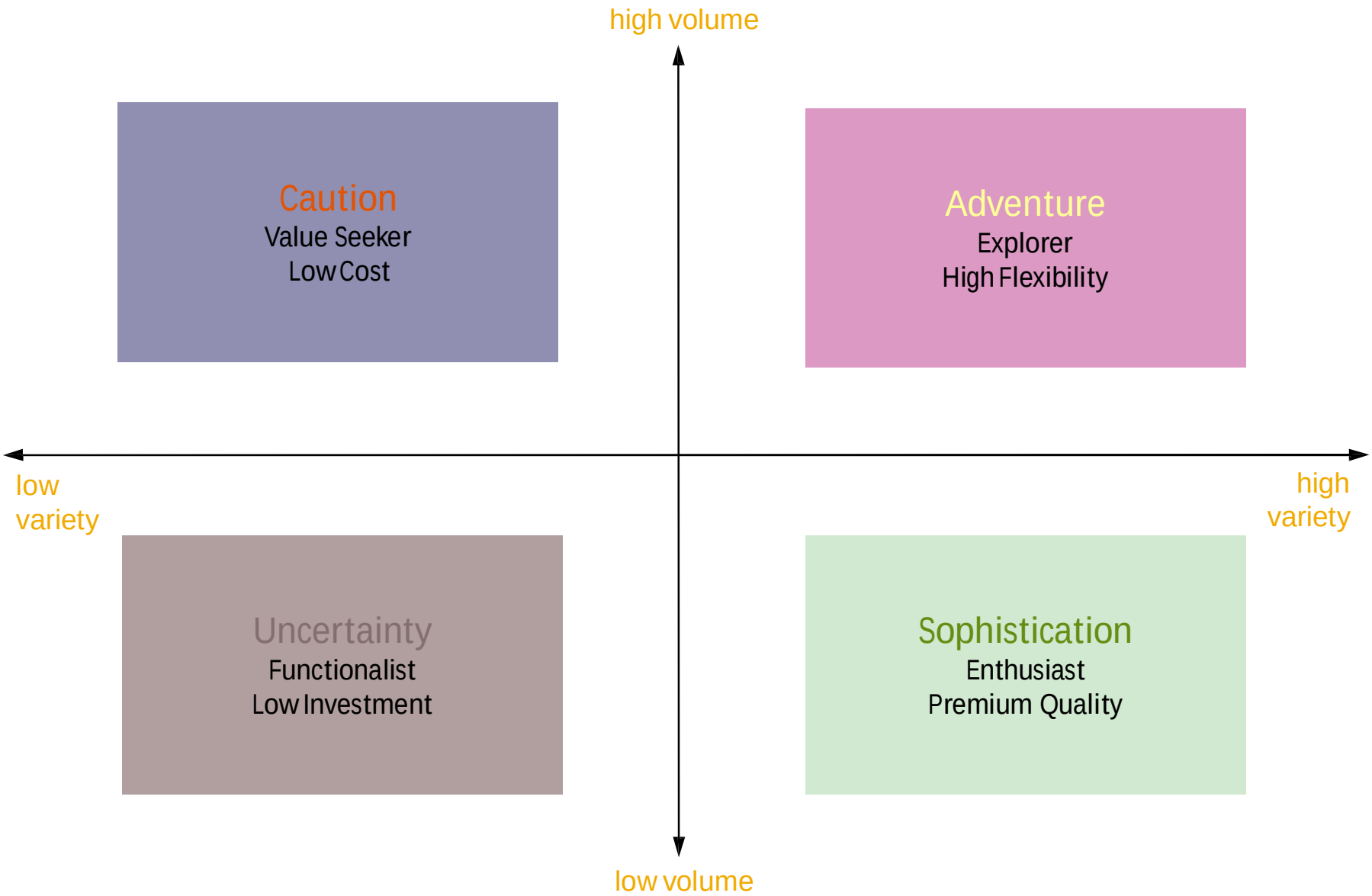


Enthusiast

Soph'cation

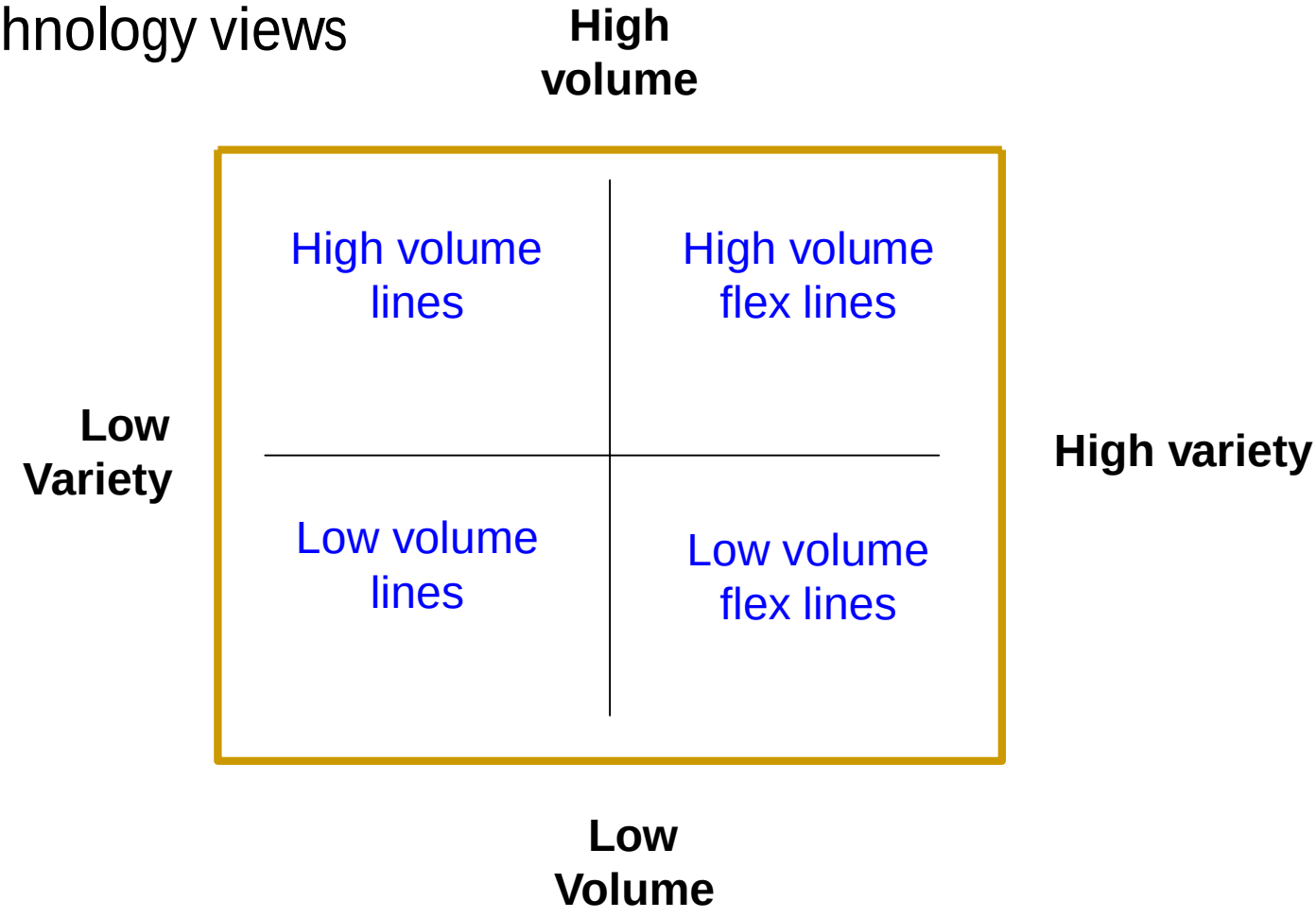
low volume

Scenarios: Overview



Scenarios help us understand the future

- Volume and Variety stand-out in a selection of key drivers of packaging line choice – when integrating consumer and technology views



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Simplicity and Flexibility:
Two key directions for the pack line of the future:

Simplicity	focussed on •*level of technology (simpler)* •*plug and play vs. black box* •*level of skill required to operate and maintain* •*easy maintenance access , spares commercially available* •*less cost option*
Flexibility	focussed on secondary package variability and responsiveness and not: •*capacity* •*primary package, e.g. flexing between glass and plastic containers* •*more cost*

Pack Lines of the Future (the end state)

Two key themes for future pack lines

The Pack Line of the Future MDT identified two key themes for future pack lines:

- *Simplicity*
- *Flexibility*

Concepts for 2 future pack lines

SIMPLE LINE

FLEXIBLE LINE

Concepts for 2 future pack halls

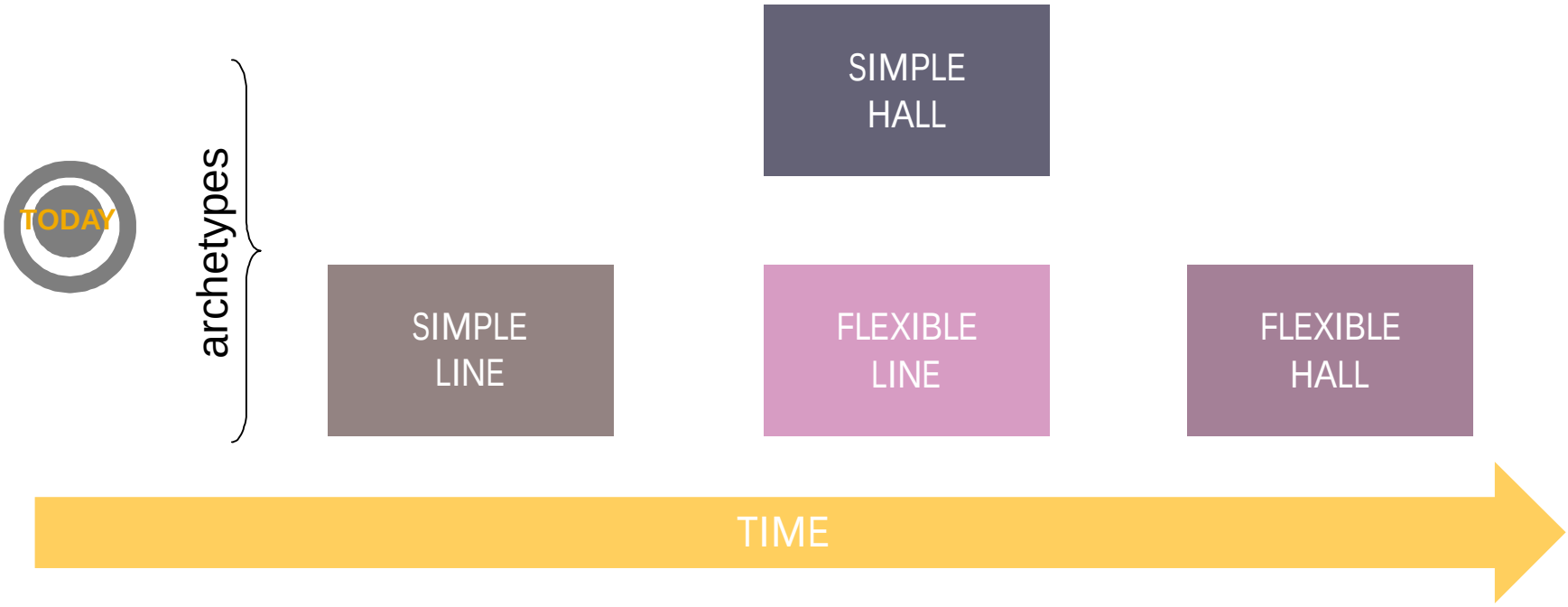
SIMPLE HALL

FLEXIBLE HALL

Pack Lines/Halls of the Future

- All options have taken into account:
  - Hygiene
  - Sustainability (Materials, water and energy)
  - Organisational design and manning
  - Maintainability, reliability and access for ease of maintenance

Pack Lines/Halls of the Future



The Simple line concept is the shortest-term

The Hall concepts are the longest-term (may require new-build pack halls)

Note: the archetype principles are interchangeable with one and other

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Pack Lines of the Future

- Two key themes for future pack lines:
  - Simplicity
  - Flexibility
- In this presentation we describe concepts for 2 future pack lines:

SIMPLE LINE

FLEXIBLE LINE

- We also describe concepts for 2 future pack halls:

SIMPLE HALL

FLEXIBLE HALL

Future Line Capabilities

Simple line	•Line, machine, assembly, and component design is focused on ease of operation and maintenance •On-site and off-site line monitoring increases line reliability and reduces the number of unplanned stoppages •Supplier shares some risk of maintenance costs •Capable of a limited number of SKUs •Still uses the latest technology and line speeds are similar to today	•Reduced maintenance costs •Reduced training and HR costs (lower skill required)
Flexibility	•Single-digit changeovers •High level of dry end flexibility •Capability to produce mixed packs	• Line efficiency maintained despite large # SKUs and changeovers • Lines can deliver a wider variety of planned packaging variations

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In conclusion

- Packaging professionals have to recognise the link between technology and the consumer.
- We have to be involved in shaping the technology platforms that will best suit the consumer need as defined by our own businesses.
- Packaging professionals are required to influence the design of technology and how we deploy it in our plants to ensure we can provide a cost effective, range of quality product to our consumer, when they need it.
- Looking at and responding to the future is a journey not an event. Its an ongoing iterative process which will build on and responds to various developments within the packaging , engineering and allied industries.

Acknowledgements

Thanks to Innovia Technologies for the assistance with the Packline of the future program……details below

Innovia TECHNOLOGY

www.innoviatech.com